ABSTRACT

A method and apparatus for estimating a seismic velocity field from seismic data including time-amplitude representations associated with source-receiver locations spaced apart by an offset distance and having a midpoint therebetween, the seismic data being arranged into common midpoint (CMP) gathers associated with respective CMP locations. A control plane having an edge intersecting a plurality of the CMP locations is defined, an initial velocity field for the control plane is produced, the initial velocity field including a plurality of time-velocity values for each of the CMP locations; and an optimized velocity field for the control plane is produced by adjusting the time-velocity values for each of the CMP locations in response to trends, relative to offset distance, in time values, associated with common seismic events, until said optimized velocity field satisfies a condition.